STRAW BALES

Definition

A temporary sediment barrier consisting of a row of entrenched and anchored straw bales. Straw bale barriers intercept and detain small amounts of sediment from disturbed areas to prevent sediment from leaving the site.

Conditions Where Practice Applies

- ✓ Below disturbed areas subject to sheet and rill erosion.
- ✓ Where the size of the drainage area is no greater than 1/4 acre per 100 feet (1,000 m 2 per 30 m) of barrier length, the maximum slope length behind the barrier is 200 feet (61 m), and the maximum slope gradient behind the barrier is 50 percent (2:1).
- ✓ In minor swales or ditch lines where the maximum contributing drainage area is no greater than 2 acres (0.8 Ha).
- ✓ Where effectiveness is required for less than three months.

Advantages

- ✓ When properly used, straw bale barriers are an inexpensive method of sediment control.

Disadvantages/Problems

- ✓ Requires regular inspection and maintenance.
- ✓ Straw bale barriers are easy to misuse and can become contributors to a sediment problem instead of a solution.
- ✓ It is difficult to tell if bales are securely seated and snug against each other.
- ✓ May become source of undesirable of noxious weeds.

Design Criteria

1. Bales shall be placed in a single row, lengthwise on the contour, with ends of adjacent bales tightly abutting one another.
2. All bales shall be either wire-bound or string-tied. Straw bales shall be installed so that bindings are oriented around the sides rather than along the tops and bottoms of the bales in order to prevent deterioration of the bindings
3. The barrier shall be entrenched and back-filled. A trench shall be excavated the width of a bale and the length of the proposed barrier to a minimum depth of 4 inches (100 mm). The trench must be deep enough to remove all grass and other material that might allow underflow. After the bales are staked and chinked (filled by wedging), the excavated soil shall be back-filled against the barrier. Backfill soil shall conform to the ground level on the downhill side and shall be built up to 4 inches (100 mm) against the uphill side of the barrier.
4. Each bale shall be securely anchored by at least two stakes or re-bars driven through the bale. The first stake in each bale shall be driven toward the previously laid bale to force the bales together. Stakes or re-bars shall be driven deep enough into the ground to securely anchor the bales. Stakes should not extend above the bales but instead should be driven in flush with the top of the bale for safety reasons.
5. The gaps between the bales shall be chinked (filled by wedging) with straw to prevent water from escaping between the bales. Loose straw scattered over the area immediately uphill from a straw bale barrier tends to increase barrier efficiency. Wedging must be done carefully in order not to separate the bales.
6. Inspection shall be frequent and repair or replacement shall be made promptly as needed.
7. Straw bale barriers shall be removed when they have served their usefulness, but not before the upslope areas have been permanently stabilized.

- ✓ Channel Flow Applications
    1. Bales shall be placed in a single row, lengthwise, oriented perpendicular to the contour, with ends of adjacent bales tightly abutting one another.
    2. The remaining steps for installing a straw bale barrier for sheet flow applications apply here, with the following addition.
    3. The barrier shall be extended to such a length that the bottoms of the end bales are higher in elevation than the top of the lowest middle bale to assure that sediment-laden runoff will flow either through or over the barrier but not around it.

Maintenance

- ✓ Straw bale barriers shall be inspected after each runoff-producing rainfall and regularly during prolonged rainfall.
- ✓ Close attention shall be paid to the repair of damaged bales, end runs, and undercutting beneath bales.
- ✓ Necessary repairs to barriers or replacement of bales shall be accomplished promptly.
- ✓ Sediment deposits should be removed when the level of deposition reaches approximately one-half the height of the barrier.
- ✓ Any sediment deposits remaining in place after the straw bale barrier is no longer required shall be dressed to conform to the existing grade, prepared and seeded.
- ✓ All temporary erosion and sediment control measures shall be removed within 30 days after final site stabilization is achieved or after the temporary BMPs are no longer needed. Trapped sediment shall be removed or stabilized on-site.
- ✓ Disturbed soil areas resulting from removal shall be permanently stabilized.